Free and Open Source Software Conference

Apple OS X und iOS Management

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Managing Mobile Devices running iOS

Configuration Profiles

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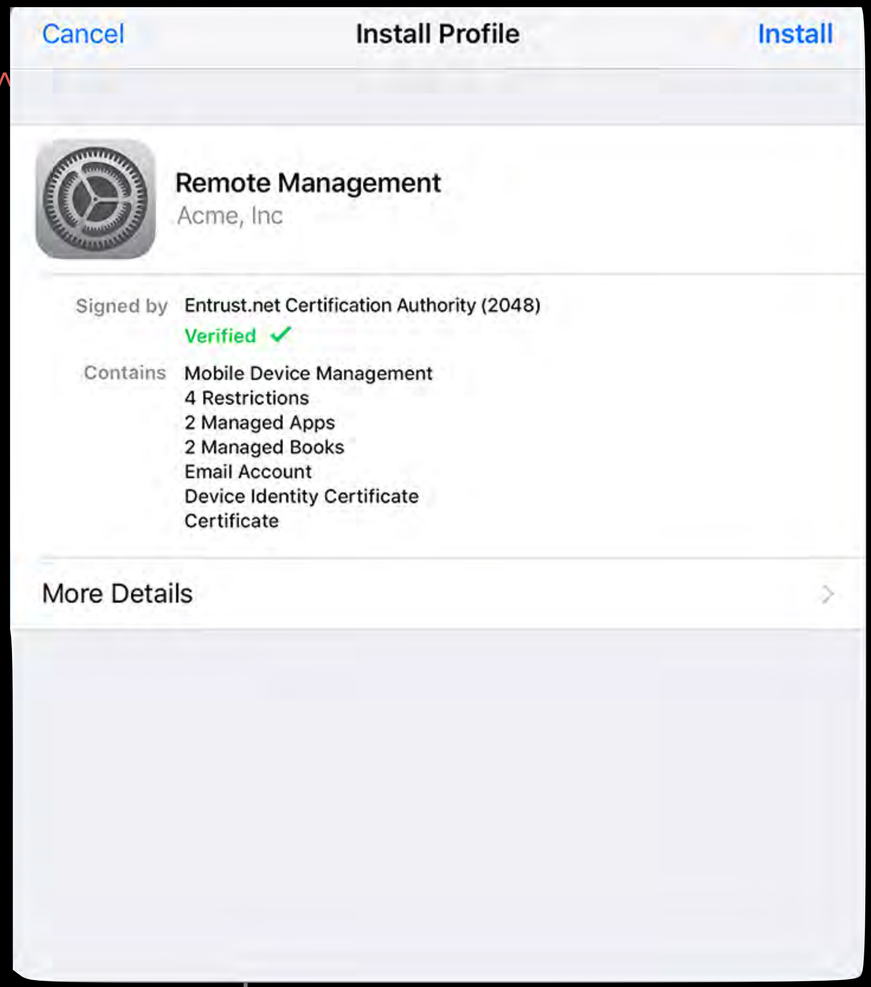
```
<?xml version="1.0" encoding="UTF-8"?>
<!DOCTYPE plist PUBLIC "-//Apple//DTD PLIST 1.0//EN" "http://www
PropertyList-1.0.dtd">
<plist version="1.0">
<dict>
    <key>PayloadIdentifier</key>
    <string>com.acme.profile.wifi</string>
    <key>PayloadRemovalDisallowed</key>
    <true/>
    <key>PayloadScope</key>
    <string>System</string>
    <key>PayloadType</key>
    <string>Configuration</string>
    <key>PayloadUUID</key>
    <string>48a39070-1e4c-0131-c321-000c2944c108</string>
    <key>PayloadOrganization</key>
    <string>ACME Inc.</string>
    <key>PayloadVersion</key>
    <integer>1</integer>
    <key>PayloadDisplayName</key>
    <string>WiFi</string>
    […]
```



Configuration Profiles (contintued)

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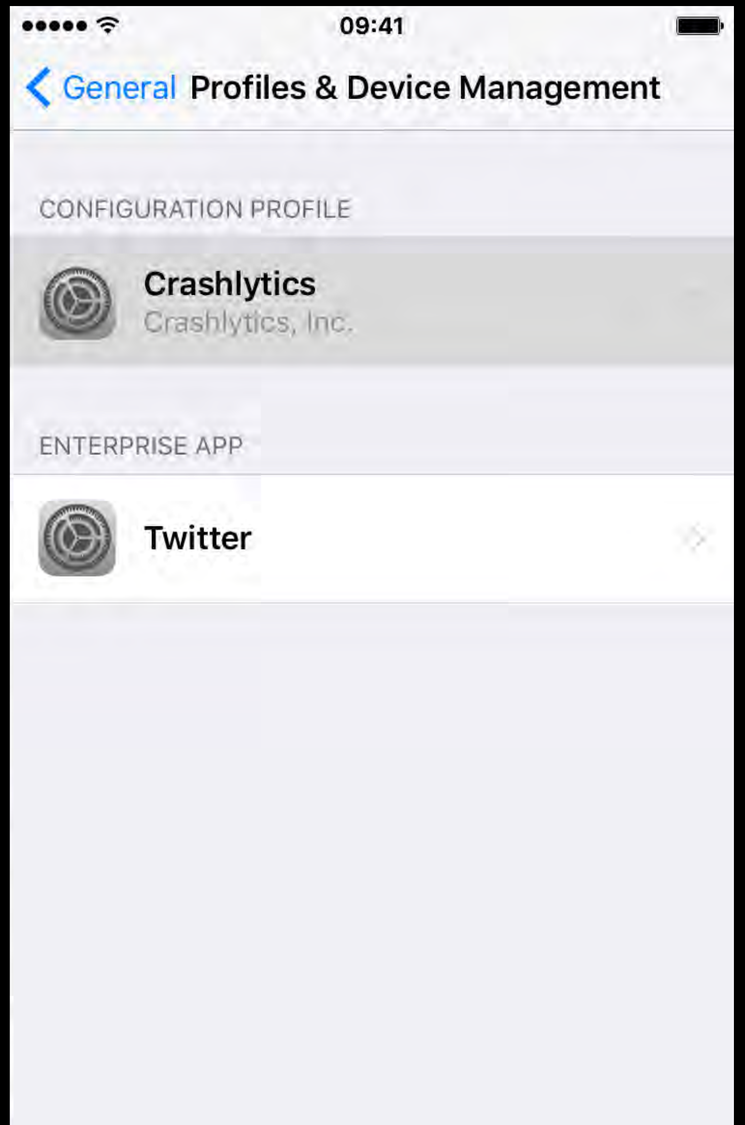
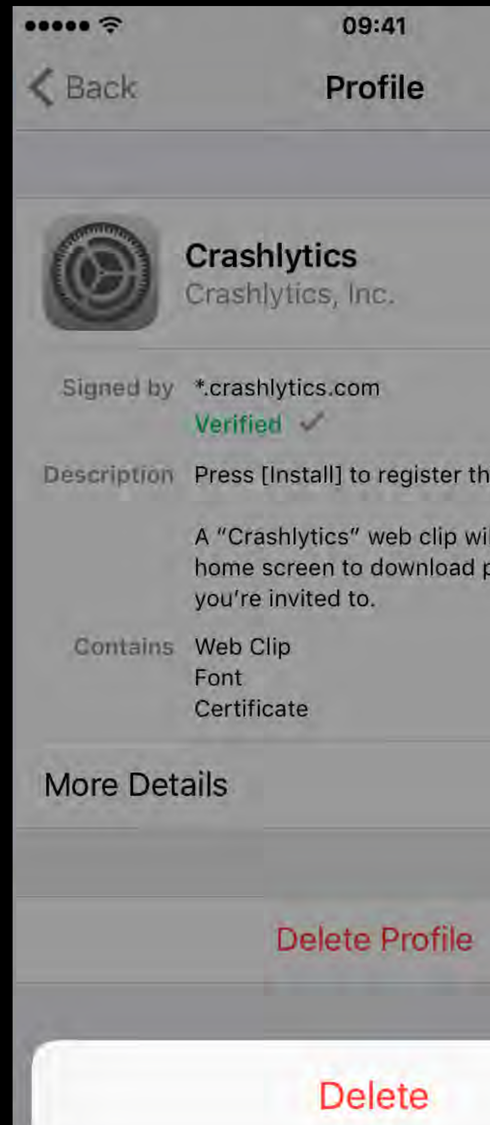
```
    <key>PayloadContent</key>
    <array>
    <dict>
        <key>PayloadType</key>
        <string>com.apple.wifi.managed</string>
        <key>PayloadVersion</key>
        <integer>1</integer>
        <key>PayloadEnabled</key>
        <true/>
        <key>EncryptionType</key>
        <string>WPA</string>
        <key>SSID_STR</key>
        <string>ssid</string>
        <key>Password</key>
        <string>password</string>
        <key>HIDDEN_NETWORK</key>
        <false/>
        <key>AutoJoin</key>
        <true/>
        […]
    </dict>
    </array>
</dict></plist>
```





Deploying Configuration Profiles

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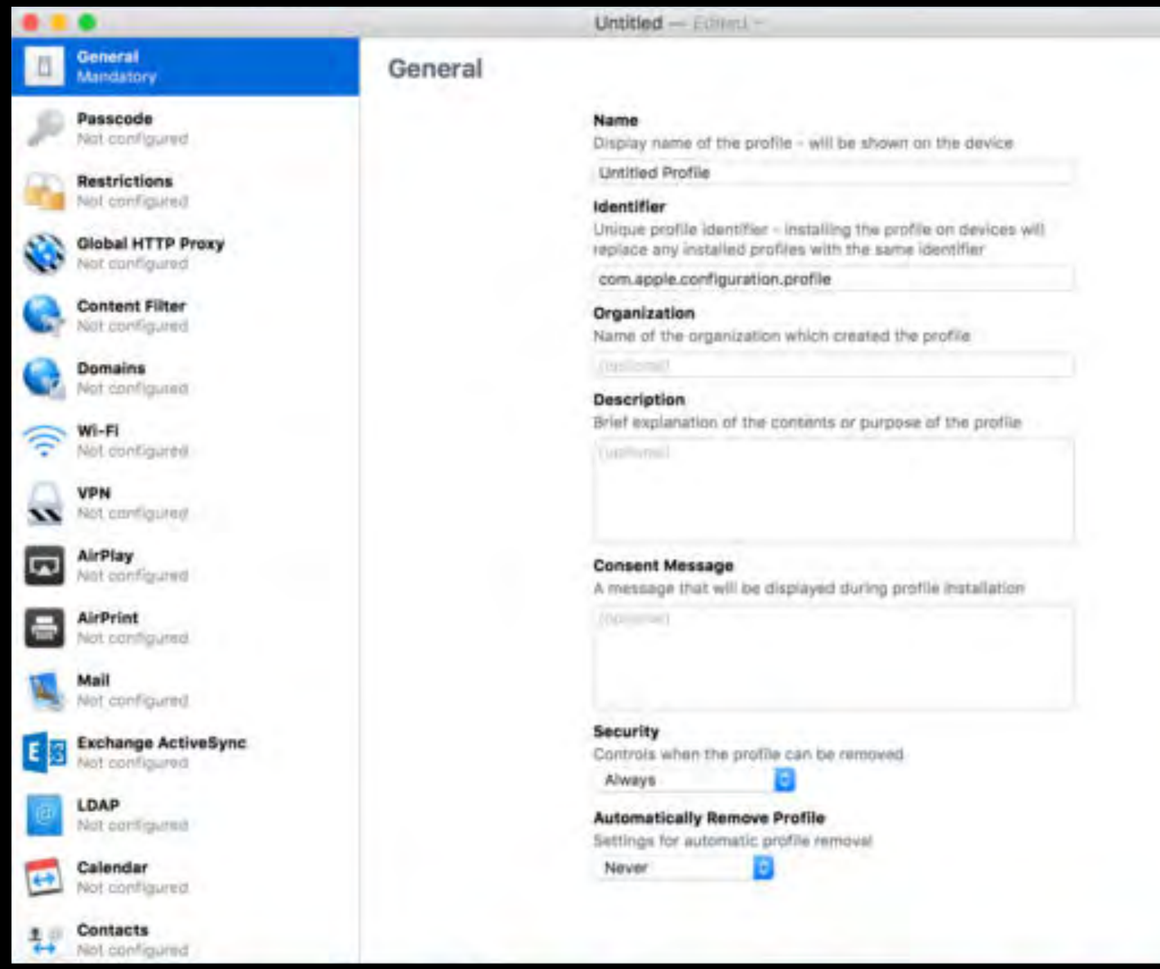
- Using Apple Configurator (iOS only)
- In an email message
- On a webpage
- Using over-the air configuration
  using a Mobile Device Management Server
  (e.g. Apple OS X Server's Profile Manager)



Mobile Device Management

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- Managed apps, books, domains, accounts, extensions, …
- Policy settings
- Security (e.g. encryption, passcodes, Touch ID, SSO)
- Remote control (e.g. selective remote wipe)
- Asset tracking
- Firmware / OS upgrades

Mobile Device Management for iOS

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- Apple OS X Server Profile Manager
  https://www.apple.com/uk/support/osxserver/profilemanager/

- Hundreds of commercial on-premises and cloud offerings. €
  Comparison of MDM solutions at http://enterpriseios.com/
  - Airwatch €
    http://www.airwatch.com
  - Bushel €
    http://www.bushel.com
  - JAMF Casper Suite €
    http://www.jamfsoftware.com

Apple OS X Server

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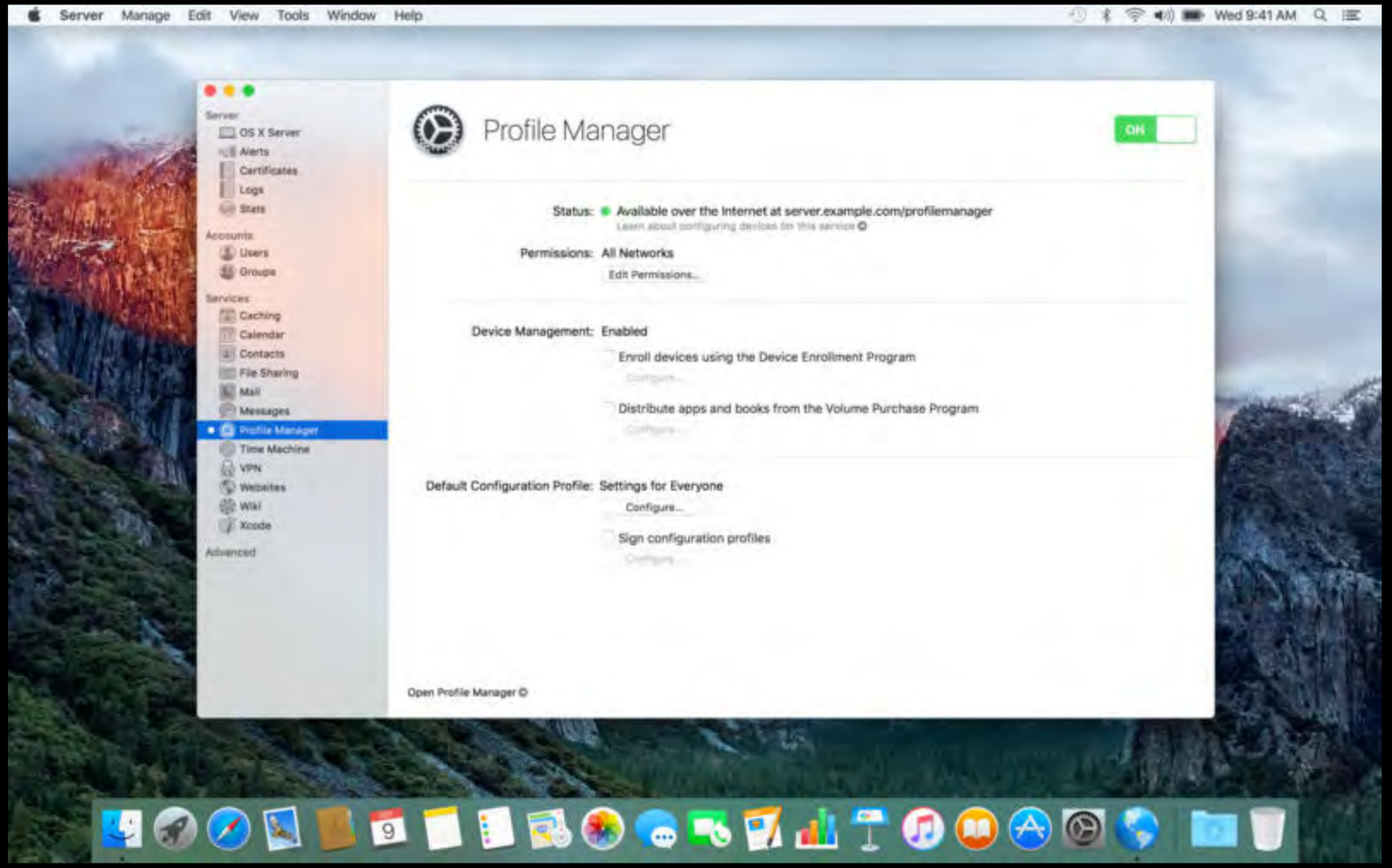

http://www.apple.com/de/osx/server/

Volume Purchase Program (VPP)

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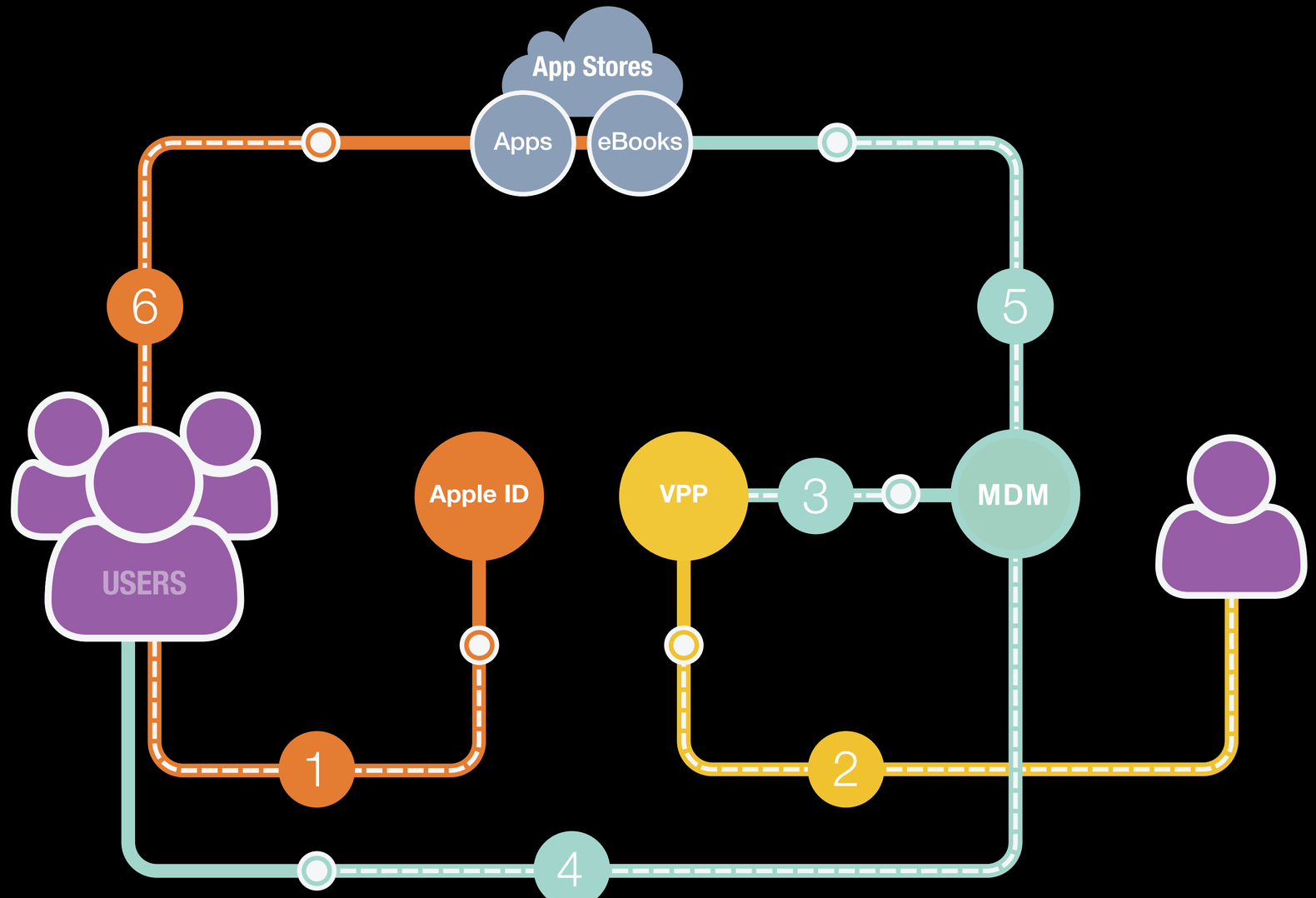
- Bulk purchase of apps and books
- Assign content to users or devices
- Deploy using MDM
- Revoke and re-assign
- Custom B2B apps for iOS



https://help.apple.com/deployment/programs/ http://images.apple.com/business/docs/VPP_Business_Guide.pdf

Orchard – iOS Management

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Procure
to DEP enabled account

Ship
directly to user

DEP
automatic MDM enrollment

MDM
Profiles, remote commands

VPP
manage Apps, eBooks

'Zero Touch' Workflow


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Linux Management Workflow

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PXE Boot

Disk Partitioning

Bootstrapping

Packages

Configuration

OS X Management Workflow

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PXE Boot

NetBoot,
NetInstall

Disk Partitioning

Bootstrapping

Imaging

Packages

Configuration

Profiles,
MCX

Apple Remote Desktop

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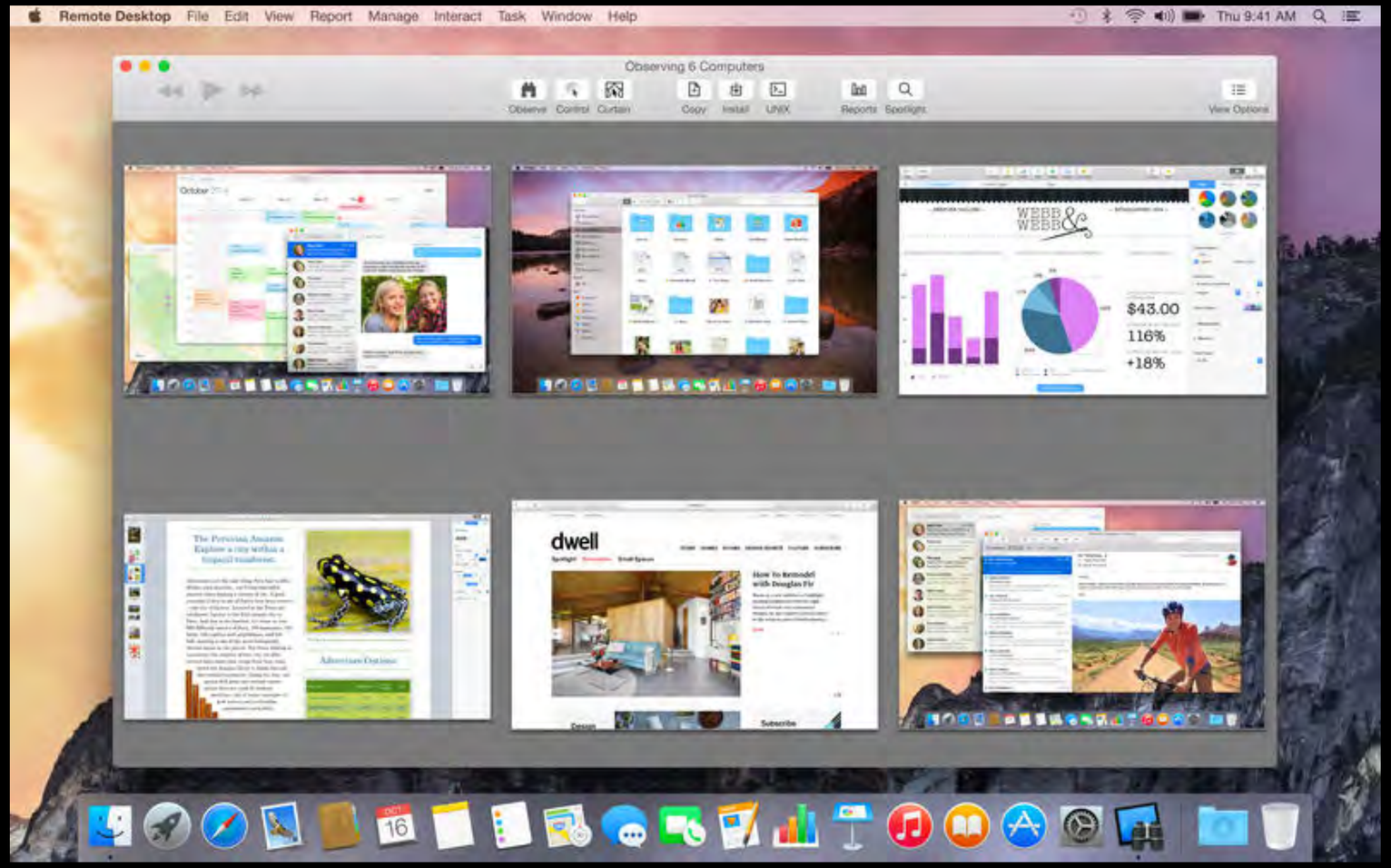

http://www.apple.com/de/remotedesktop/

Booting over the Network

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- Apple BSDP – Boot Service Discovery Protocol

  http://www.opensource.apple.com/source/bootp/bootp-170/Documentation/BSDP.doc

  - BSDP may coexist with any DHCP service
  - OS X 10.11 adds security enhancements

    `csrutil netboot add <address>` – https://support.apple.com/en-gb/HT205054

- BSDP Implementations
  - Apple OS X Server NetInstall service
  - BSDPy - Python implementation of BSDP

    https://bitbucket.org/bruienne/bsdpy
  - ISC DHCPD, TFTP, HTTP-Server (e.g. Apache2, nginx)

- Justin Elliot: NetBoot Fundamentals and Customizations

  https://youtu.be/yKS2moLySi0

NetBoot Image Types

- **NetBoot** – Boot a server based OS X image
  - Diskless requires AFP or NFS share to store 'shadow' files
  - Hack the OS X image to use a RAMDisk instead

    https://www.afp548.com/2011/02/01/serving-diskless-netboot-for-your-macs-without-os-x-server/

- **NetInstall** – Boot an OS X installer

- **NetRestore** – Restore a volume using an `asr` disk image

Network Disk Image Creation

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- Manual
  - Apple System Image Utility

    https://support.apple.com/en-gb/HT202652

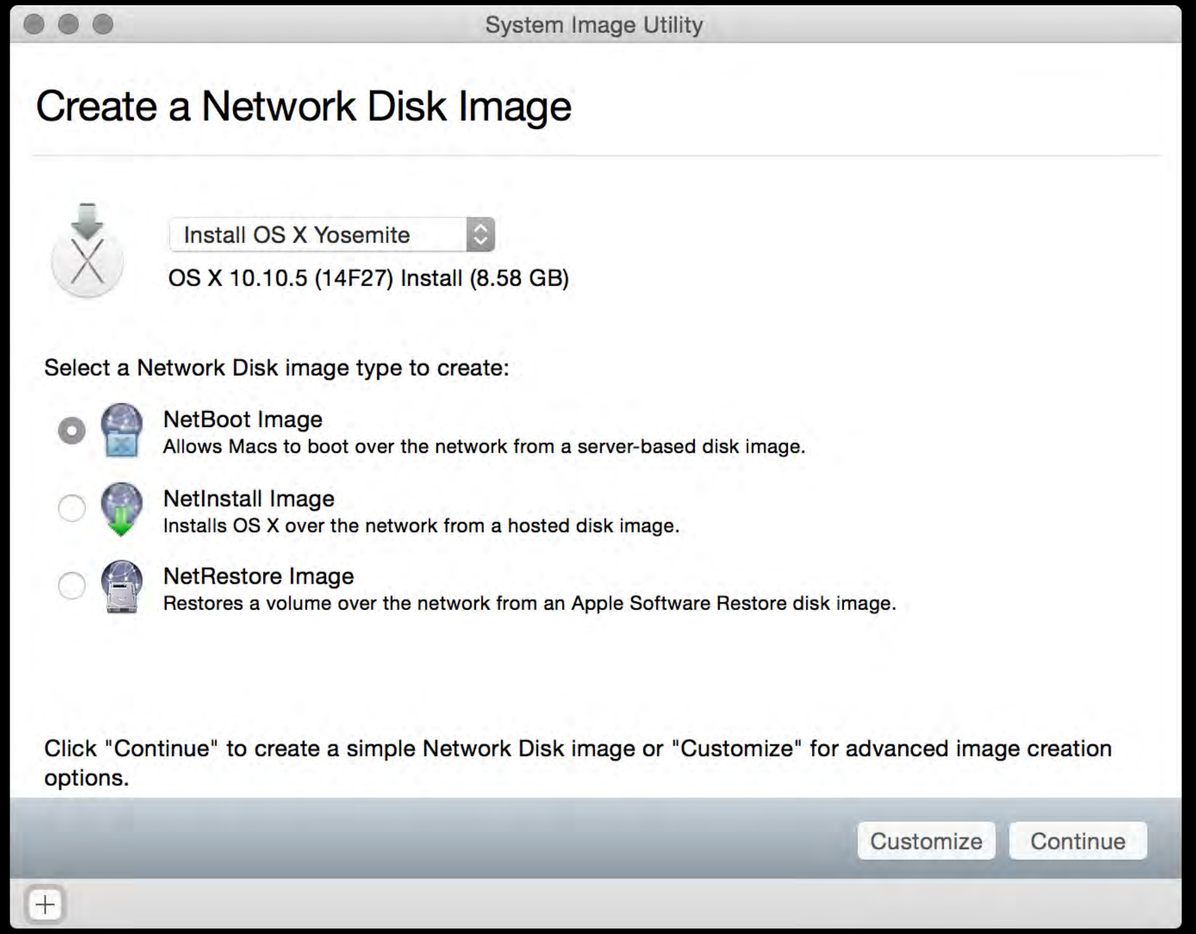
    https://support.apple.com/en-gb/HT202061
  - Casper NetInstall Image Creator

    https://github.com/jamf/CasperNetInstallCreator
  - AutoCasperNBI

    https://github.com/macmule/AutoCasperNBI/

- Scripted
  - AutoNBI.py

    https://bitbucket.org/bruienne/autonbi




Finder File Edit View Go Window Help
Wed 11:12 a.m.

Imaging Techniques

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Thick Image

Hybrid Image

Thin Image

No Image

Source: http://technet.microsoft.com/en-us/library/ee956904(WS.10).aspx

Imaging Software

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- Apple asr (and derived tools)
- Casper Imaging €
  www.jamfsoftware.com/products/casper-suite/
- DeployStudio
  http://www.deploystudio.com/
- Imagr
  https://github.com/grahamgilbert/imagr
- FileWave Imaging €
  https://www.filewave.com/products/imaging/
- LANrev (formerly known as Absolute Manage) €
  https://heatsoftware.com/lanrev/

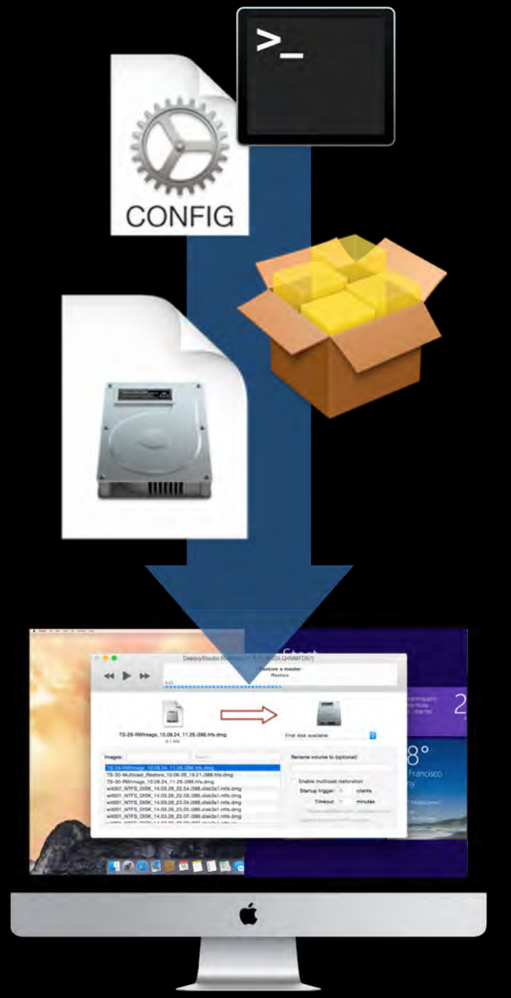

Image Creation

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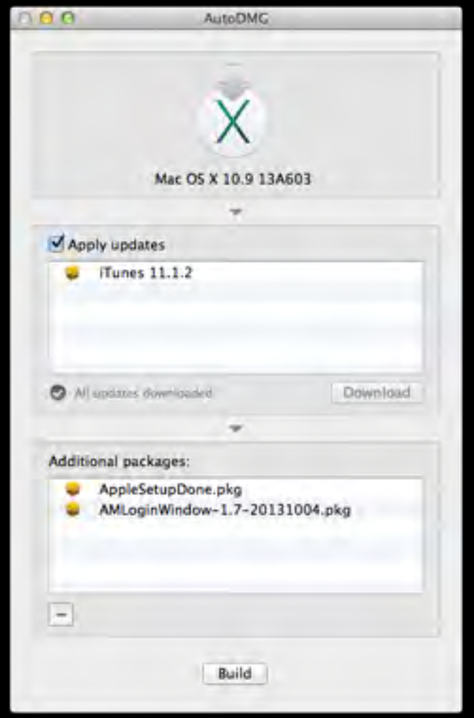
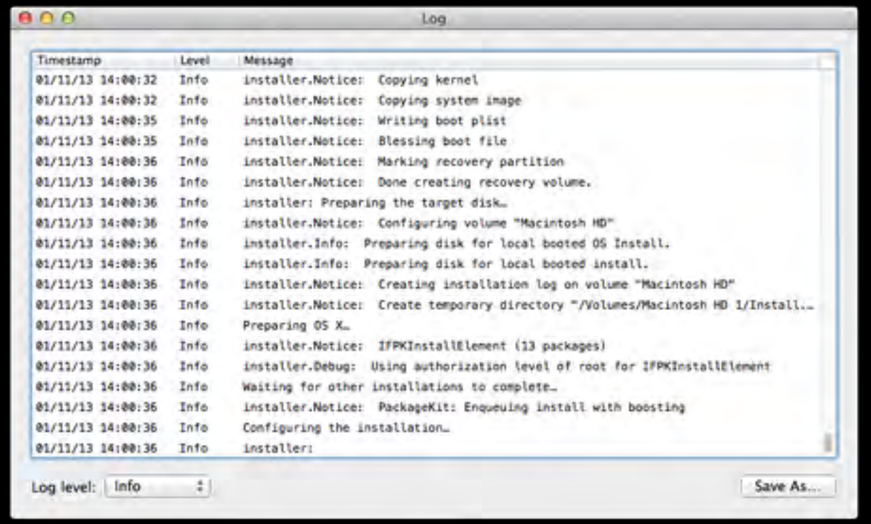
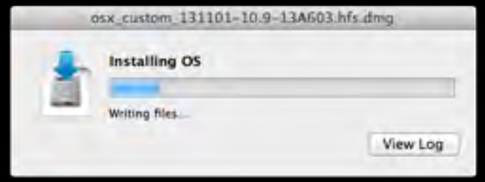
- Apple Disk Utility
  https://support.apple.com/en-gb/HT202841
- AutoDMG
  https://github.com/MagerValp/AutoDMG
- Casper Composer €
  www.jamfsoftware.com/products/casper-suite/
- FileWave Imaging €
  https://www.filewave.com/products/imaging/
- NBICreator (beta)
  https://github.com/NBICreator/NBICreator








Finder File Edit View Go Window Help
Wed 11:12 a.m.
SKYNET
CYBERDYNE
SYSTEMS

Inventory & Management

- Filewave €

  https://www.filewave.com/

- HEAT LANrev (formerly Absolute Manage) €

  https://heatsoftware.com/lanrev/

- JAMF Casper Suite €

  http://www.jamfsoftware.com/products/casper-suite/

- Microsoft System Center Configuration Manager (SSCM) €

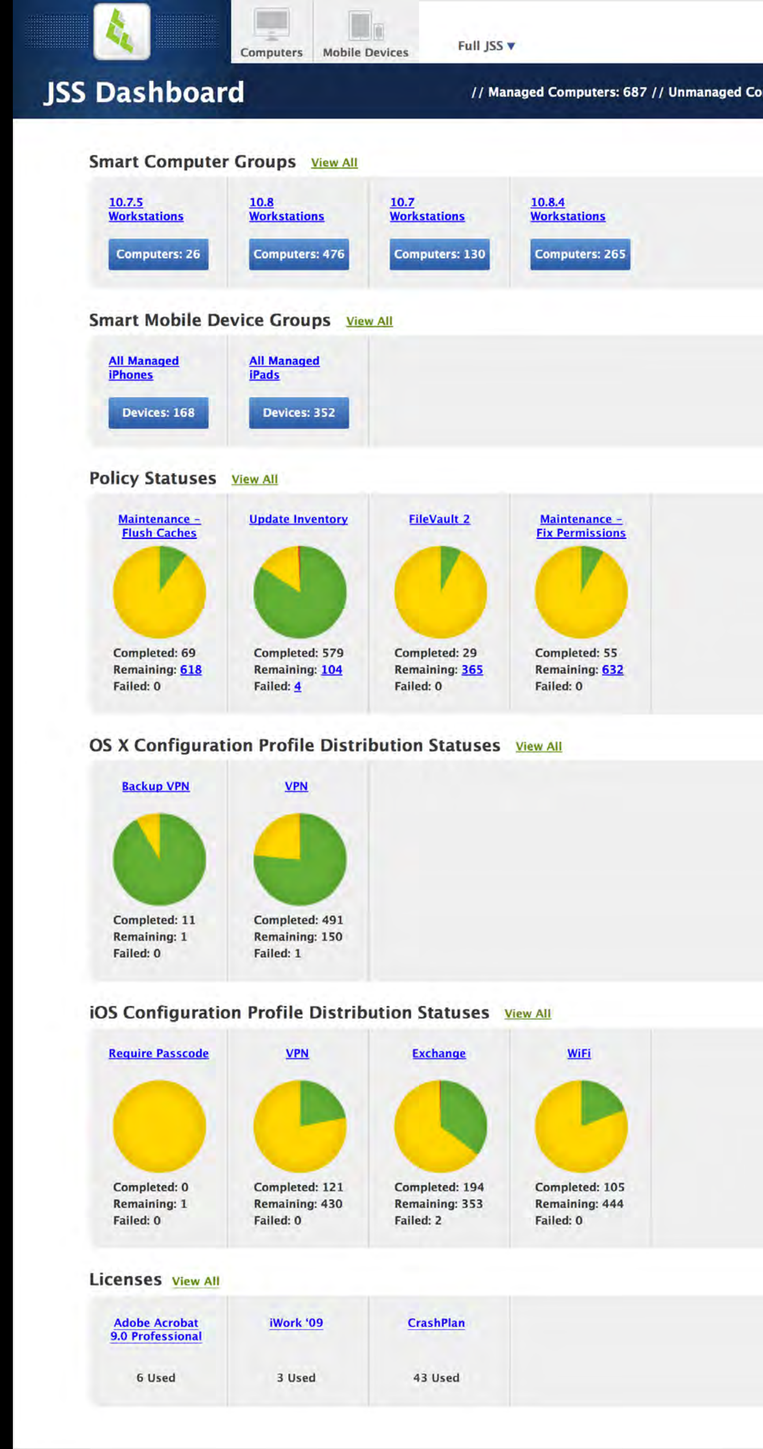
  https://www.microsoft.com/en/server-cloud/products/system-center-configuration-manager/

- SAL+ €

  http://salsoftware.com/

SAL

https://github.com/salsoftware/sal



Challenge: Applications

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/Users/horst

/Users/horst/Applications

/Applications

The OS X platform lacks a package manager like apt, yum or zypper

Munki

https://github.com/munki/munki/wiki

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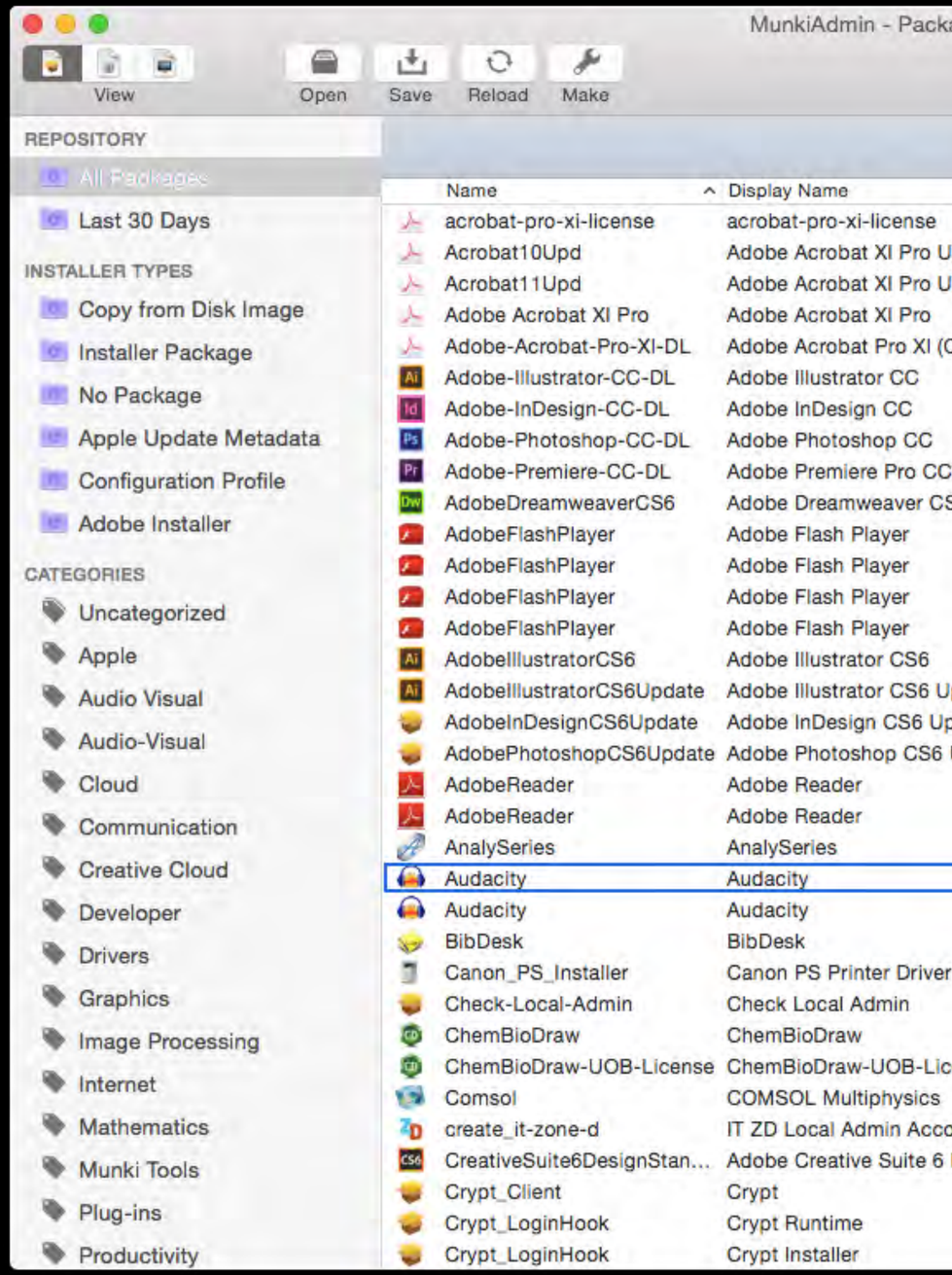
- System administrator friendly toolset
  - text based configuration
  - powerful command line tools
- Friendly user interface:
  Managed Software Center.app
- Excellent tool ecosystem
- MacSysadmin 2014 - G. Neagle:
  What's new with Munki?
  http://docs.macsysadmin.se/2014/2014doc.html

Munki Ecosystem

- MunkiAdmin https://github.com/hjuutilainen/munkiadmin
- SAL https://github.com/salsoftware/sal
- munkireport-php https://github.com/munkireport/munkireport-php
- MunkiWebAdmin https://github.com/munki/munkiwebadmin
- munki-staging https://github.com/ox-it/munki-staging
- Simian https://github.com/google/simian
- Manana https://github.com/ox-it/manana

and many many more https://github.com/timsutton/python-macadmin-tools#munki



AutoPkg

https://github.com/autopkg/autopkg

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- Automated preparation of software for managed distribution
- Community maintained recipes (PropertyList XML) to automate complex tasks

  ```
  Firefox.download.recipe
  Firefox.pkg.recipe
  Firefox.munki.recipe
  ```

- Excellent integration with Munki
- Workflows for other management tools like Absolute Manage, JAMF Casper Suite
- Recipe Robot

  https://github.com/homebysix/recipe-robot
- MacSysadmin 2014- G. Neagle, T. Sutton

  AutoPkg: Crowd-sourcing Mac packaging and deployment

  http://docs.macsysadmin.se/2014/2014doc.html

Challenge: OS X Releases

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OS X Yosemite release history

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10.10.5	14F1509	
10.10.4	14E46	
10.10.3	14D131	14D136
10.10.2	14C109	14C1510, 14C1514, 14C2043, 14C2513
10.10.1	14B25	
10.10	14A389	

Solution: In-Place Upgrades

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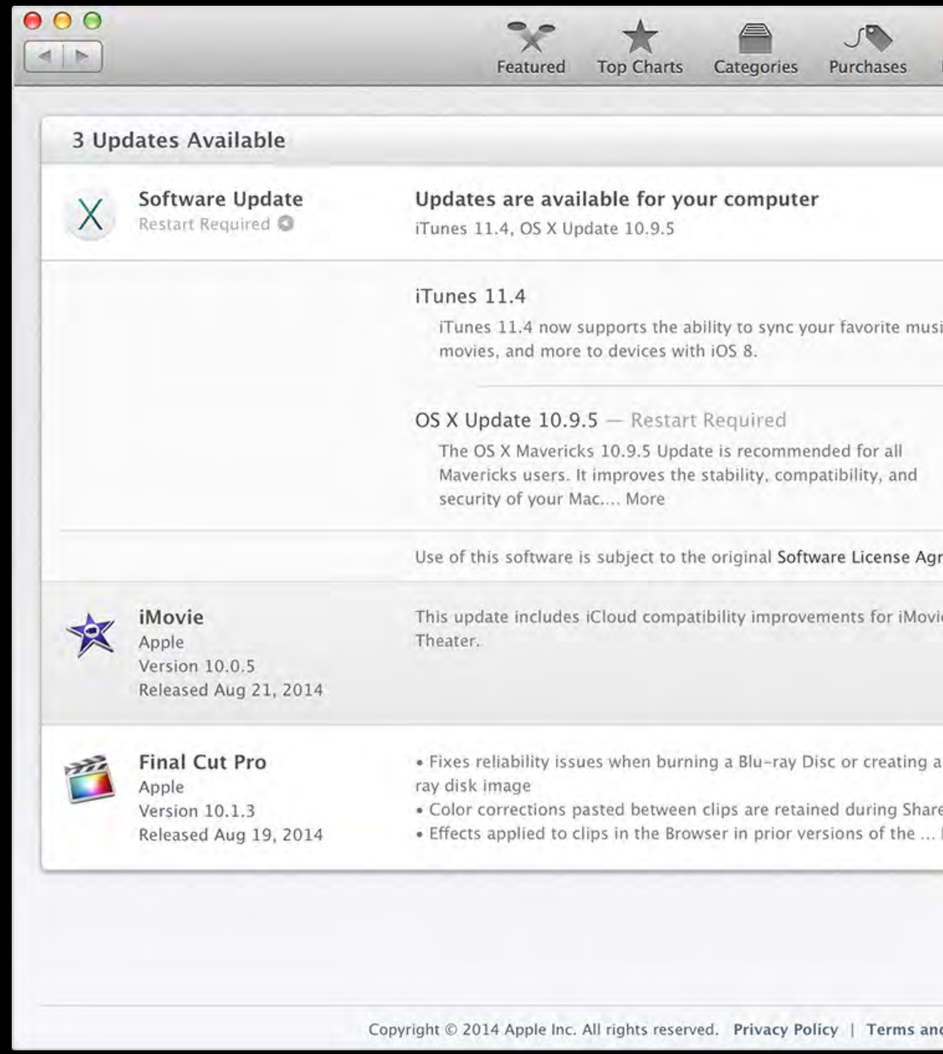
- Minor version updates:
  - Apple Software Update based workflows
- Software Update Servers:
  - Apple SUS as part of Server
  - Reposado
    https://github.com/wdas/reposado
  - Margarita
    https://github.com/jessepeterson/margarita
- Major version updates:
  - All commercial management suites provide workflows
  - createOSXinstallPkg
    https://github.com/munki/createOSXinstallPkg



Challenge: Configuration

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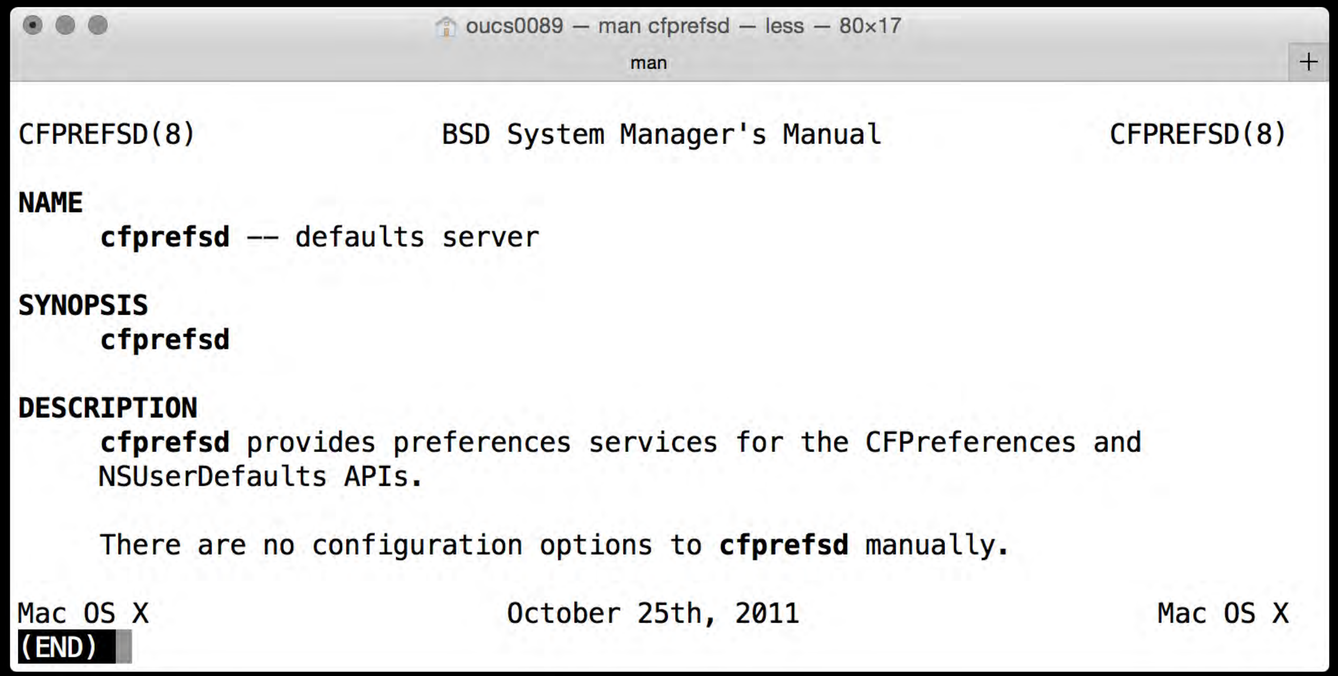
- Several configuration methods
  - defaults / plists
  - MCX
  - Profiles
  - proprietary (files, databases)
- Configuration caching using cprefsd (introduced 10.9)



Solution: Configuration Management

- Profiles & MDM
- Configuration management tools:
  - chef
    https://www.chef.io/chef/
  - puppet
    https://puppetlabs.com/puppet/puppet-open-source
- Munki: scripts in combination with (payload free) packages
  - idempotency
  - use Apple tools whereas possible
- All commercial management suites provide workflows €

Mobile Device Management for OS X

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- Apple OS X Server – Profile Manager
  https://www.apple.com/uk/support/osxserver/profilemanager/
- Hundreds of commercial on-premises and cloud offerings. €
  Comparison of MDM solutions at http://enterpriseios.com/
- coMmanDMent
  https://github.com/jessepeterson/commandment
- microMDM
  https://micromdm.io/
- mdmvendorsign - CSR for Apple's MDM push service
  https://github.com/grinich/mdmvendorsign

Authentication & Authorisation

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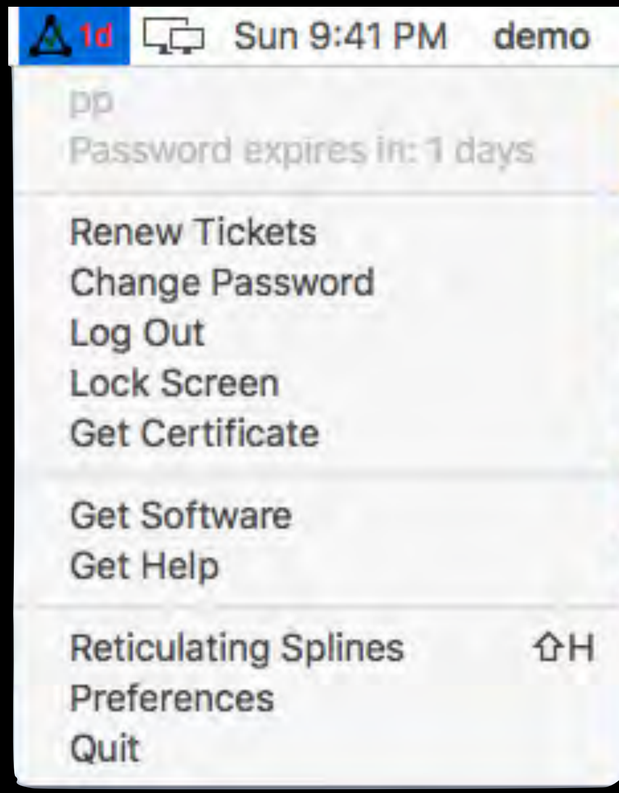
- Built-in Active Directory client
  - (restricted) AD support
  - 'mobile' accounts
- Apple Enterprise Connect $ (US only)
- NoMAD – the best of AD without binding to it
  "NoMAD allows for all of the functionality you would want from a Mac bound to Active Directory without having to actually bind to AD."
  https://gitlab.com/Mactroll/NoMAD/
- KerbMinder – automatically refresh Kerberos tickets
  https://github.com/pmbuko/KerbMinder



Encryption: FileVault2

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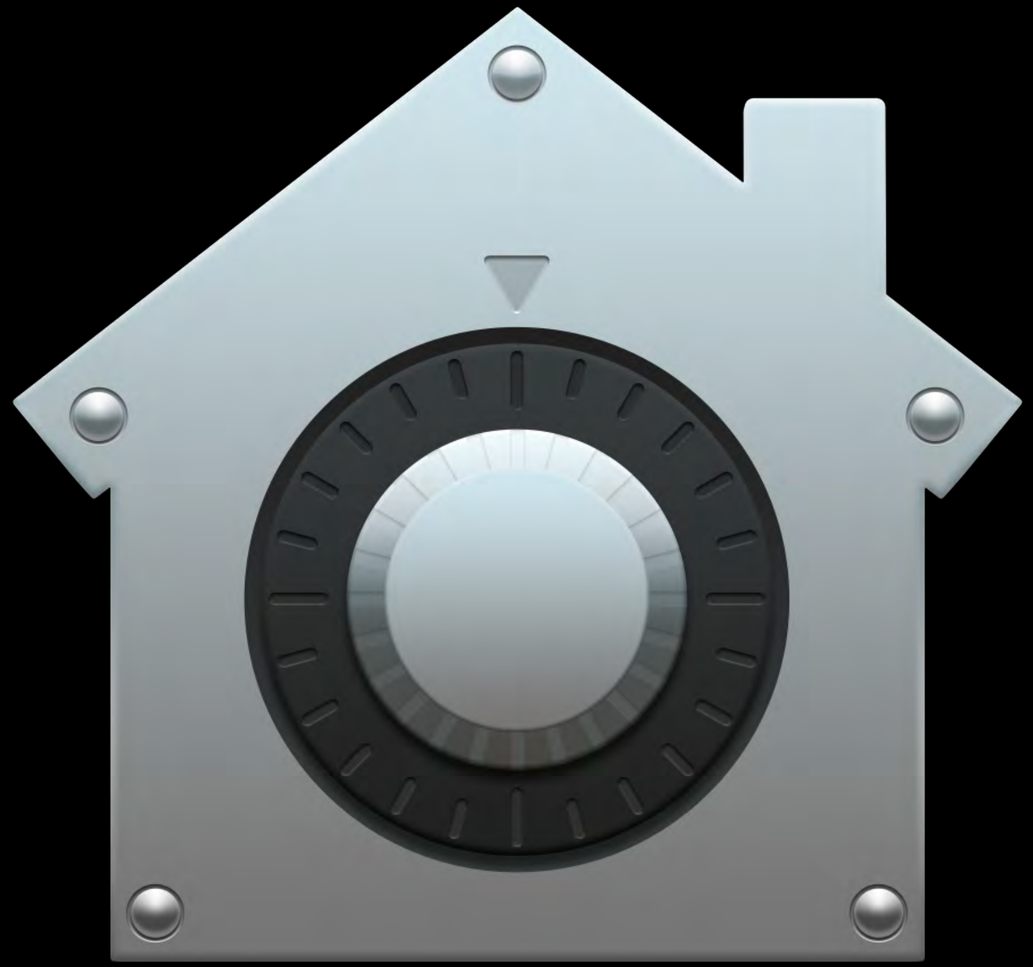
- Require & enforce FileVault2 (via Profile)
- Recovery key escrow solutions
  - Cauliflower Vest
    https://github.com/google/cauliflowervest
  - Crypt
    https://github.com/grahamgilbert/Crypt
  - Most commercial management suites €



Security: More Useful Tools

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- osquery – endpoint visibility
  https://osquery.io/
- Plan B – remediation for managed Macs
  https://github.com/google/macops-planb
- Santa – binary whitelisting/blacklisting system
  https://github.com/google/santa
- Zentral – Elastic search based infrastructure event handler
  https://github.com/zentralopensource/zentral

Orchard – OS X Management

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DEP


MDM


Profiles


AD Binding


VPP


Munki

Branding


Non-App Store


Updates

NetBoot & Imaging

Key Lessons Learned

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- Trust your users – don't be the evil BOFH
- Automate yourself out of your job ;)
- Never fight against Apple's tools and workflows
  - Follow the official deployment references
  - Use the Device Enrollment Program
  - Use the App Store (and VPP)
- Don't be afraid to ask for help – join the Mac admin community on Slack

  http://macadmins.org

Official References

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iOS Deployment Reference

http://help.apple.com/deployment/ios/

OS X Deployment Reference

http://help.apple.com/deployment/osx/

Apple Developer Program

http://developer.apple.com

Vielen Dank!

https://github.com/mjung/publications

Marko Jung

Galactic Viceroy of Research Excellence

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http://mju.ng/give